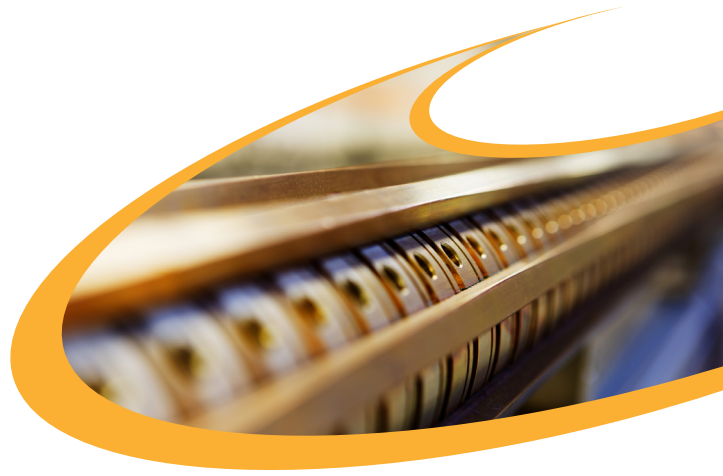


MAX IV Laboratory Update 01|2014



Linac installed

The MAX IV linac is at the moment the longest linear accelerator in Europe. Its 300 meter of accelerating structures and guiding magnets results in an electron bunch suitable for both injections into the MAX IV storage rings, and to drive the Short Pulse Facility. The linac is almost completely installed and tests of the subsystems have already started. The linac will start accelerating electrons in March 2014.

When injecting into the storage rings the linac will create high charge bunches from a thermionic gun. These bunches are transported at the corresponding full energy to either the 1.5 GeV or 3 GeV storage ring. The challenge for the ring injection pulses is to get the energy spread and transverse beam size low at the injection point, while controlling the charge and time structure in the bunch.

For the short pulse facility the demands on the electron beam is even higher than for ring injection. Low emittance bunches are created in a high brightness photo cathode gun and are then compressed from 8 ps to below 100 fs. This compression is done in two sets of bunch compressors along the linear accelerator. The magnetic double achromats used as bunch compressors has a positive R56 unlike the commonly used magnetic chicane which has a negative R56.

The electrons are therefore accelerated on the falling slope of the RF voltage. Both types of bunch compressors naturally have a positive T566, and the MAX IV compressors uses this natural non linearity together with a weak sextupoles to linearise longitudinal phase space, leaving no need for a harmonic cavity. The MAX IV linac bunch compressors are the first of their kind in a linear accelerator and manage to not only compress the bunches to the ultra-short dime durations necessary, but also keeps the transverse quality of the beam through the process.

Funding secured

Lund University and the Swedish Research Council has announced thier funding decisions for 2014–2018. The MAX IV Laboratory got full operations funding and the amount necessary to build two new state-of-the-art beamlines as well as transfer three existing beamlines from MAX II & III to MAX IV.

Inaguration will take place on the 21 June 2016, the brightest day of the year, for the brightest light source in the world.

www.maxlab.lu.se